Prenatal 1	Exposure to Perf	luorinated Chemic	als and Behavioral	or Coordination I	Problems
at Age 7					

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Supplemental Material, Table 1. Characteristics of study subjects according to maternal PFOS

levels (ng/mL) in quartiles.

Characteristics	7.3-26.4	26.6-34.3	34.4-44.3	44.5-106.7
Maternal age at delivery (yr) a,*	31.9±4.2	31.1±4.2	30.3±4.3	30.0±4.2
Pre-pregnancy BMI (kg/m²) a, b, *	22.9±3.6	23.7±4.6	24.3±4.5	23.8±3.9
Parent's behavioral scores <sup>a</sup>	$6.63\pm1.63$	$6.50\pm1.55$	6.47±1.55	6.59±1.58
Gestational week at blood	$8.10\pm2.10$	7.99±1.98	$7.98\pm2.15$	8.00±2.14
drawing (weeks) <sup>a</sup>	0.10±2.10	1.99±1.90	7.90-2.13	0.00±2.1 <del>4</del>
Parity (%) *				
0	31.6	40.1	52.3	53.8
1	44.4	38.1	27.9	32.5
>2	24.0	21.8	19.8	13.7
Maternal socio-occupational status	24.0	21.0	17.0	13.7
(%)*				
Higher	63.8	56.4	49.2	45.2
Middle	27.6	35.5	44.2	45.2
Lower	8.7	8.12	6.6	9.6
House Density (%) *	0.7	0.12	0.0	7.0
<1 room/person	31.6	24.9	22.8	18.8
1 room/person	25.0	26.4	34.0	30.5
1-1.5 room /person	29.6	30.5	24.4	27.4
≥1.5 room /person	13.8	18.3	18.8	23.4
Alcohol consumption before				
pregnancy (drinks/week) (%) b				
0-<1	54.6	50.3	54.8	59.9
1-1.5	16.3	13.2	19.3	14.7
2-3	16.8	20.8	13.2	16.8
>3	12.2	15.7	12.7	8.6
Smoking during pregnancy (%)	19.4	24.9	23.4	16.8
Gender of child (boy, %)	46.4	51.8	47.2	51.8
Birth year (%) *				
1998	6.6	6.1	8.1	13.7
1999	21.4	25.9	30.5	24.9
2000	31.6	29.4	28.4	28.4
2001	19.9	28.9	22.8	21.3
2002	20.4	9.64	10.2	11.7
Duration of breastfeeding (%) *				
<3 month	10.2	12.7	12.2	18.3
3-5 months	12.2	20.8	17.3	22.3
≥6 months	77.6	66.5	70.6	59.4

<sup>&</sup>lt;sup>a</sup> Mean±SD

b Missing data: pregnancy BMI (n=19), alcohol consumption (n=11)
\* Statistically significant p < 0.05 (Analysis Of Variance test for maternal age at delivery and prepregnancy BMI, Chi-square test for parity, maternal socio-occupational status, birth year, and duration of breastfeeding); borderline statistically significant p =0.05 (Chi-square test for house density)

Supplemental Material, Table 2. Associations between maternal PFOS concentrations and the SDQ or DCDQ scores, using ordinal logistic regression and multiple linear regression models

Outcomes	OR (95% CI) <sup>a</sup>				Regression coefficient	p-value for
	1 <sup>st</sup> quartile	2 <sup>nd</sup> quartile	3 <sup>rd</sup> quartile	4 <sup>th</sup> quartile	(95% CI) <sup>b</sup>	regression coefficient
Total difficulties scores <sup>c</sup>	1.00	1.15 (0.80, 1.66)	0.86 (0.59, 1.24)	1.14 (0.78, 1.66)	0.035 (-0.093, 0.163)	0.59
Emotional symptoms <sup>c</sup>	1.00	0.86 (0.59, 1.25)	0.93 (0.64, 1.37)	0.87 (0.59, 1.28)	-0.015 (-0.136, 0.106)	0.81
Hyperactivity <sup>c</sup>	1.00	1.25 (0.86, 1.81)	0.86 (0.59, 1.25)	1.32 (0.90, 1,94)	0.064 (-0.058, 0.187)	0.30
Conduct problems c	1.00	0.88 (0.61, 1.28)	0.70 (0.48, 1.04)	1.00 (0.68, 1.46)	0.020 (-0.086, 0.126)	0.71
Peer problems <sup>c</sup>	1.00	1.38 (0.89, 2.12)	1.29 (0.82, 2.01)	1.14 (0.73, 1.79)	0.031 (-0.067, 0.130)	0.53
Prosocial behavior <sup>c</sup>	1.00	1.07 (0.74, 1.55)	1.10 (0.75, 1.59)	1.63 (1.12, 2.38)	-7.8 (-13.9, -1.7)	0.01 *
Developmental coordination disorder <sup>d</sup>	1.00	1.24 (0.80, 1.90)	1.21 (0.77, 1.89)	0.82 (0.52, 1.29)	64.7 (-255.4, 126.0)	0.51

PFOS concentrations (ng/mL): 1st quartile (7.3-26.4), 2nd quartile (26.6-34.3), 3rd quartile (34.4-44.3), and 4th quartile (44.50-106.70)

PFOS concentrations in linear regression were natural log-transformed

\* Statistically significant p < 0.05

a Ordinal Logistic regression models, in which the outcomes were recoded as the following: total difficulties score (old values were in brackets) [0 (0-1), 1 (2-3), 2 (4-5), 3 (6-7), 4 (8-10),5(≥11)], emotional symptoms [0 (0), 1 (1), 2 (2),3 (≥3)], hyperactivity [0 (0), 1 (1), 2 (2), 3 (≥3)], conduct problems [0 (0), 1 (1), 2 (2),3 (≥3)], peer problems [0 (0), 1 (1), 2 (≥2)], prosocial behavior [0 (10), 1 (9), 2 (8), 3 (≤7)], and developmental coordination disorder [0 (≤64), 1 (64-69), 2 (70-73), 3 (≥74)]

<sup>&</sup>lt;sup>b</sup> Multiple linear regression, the full transformation for the total difficulties score and four subscales of SDQ (emotional symptoms, hyperactivity, conduct problems, peer problems):  $\log_2$  (score+1). The full transformation for the scores of prosocial behavior and developmental coordination disorder: (score)<sup>4</sup> (a power transformation with p = 4); and the transformed prosocial behavior score was divided by 100 and the transformed developmental coordination disorder was divided by 10,000.

<sup>&</sup>lt;sup>c</sup> Adjusted for parity, maternal age, pre-pregnancy BMI, smoking and alcohol consumption during pregnancy, socio-occupational status, gender of child, breastfeeding, birth year, home density, gestational age at blood drawing, and parental behavioral problem scores during their childhood <sup>d</sup> Adjusted for parity, maternal age, pre-pregnancy BMI, smoking and alcohol consumption during pregnancy, socio-occupational status, gender of child, breastfeeding, birth year, home density, and gestational age at blood drawing

Supplemental Material, Table 3. Associations between maternal PFOA concentrations and the SDQ or DCDQ scores, using ordinal logistic regression and multiple linear regression models

Outcomes	OR (95% CI) <sup>a</sup>				Regression coefficient	p-value for
	1 <sup>st</sup> quartile	2 <sup>nd</sup> quartile	3 <sup>rd</sup> quartile	4 <sup>th</sup> quartile	(95% CI) <sup>b</sup>	regression coefficient
Total difficulties scores c	1.00	0.76 (0.53, 1.10)	0.65 (0.44, 0.94)	0.92 (0.62, 1.37)	-0.030 (-0.150, 0.090)	0.626
Emotional symptoms <sup>c</sup>	1.00	1.02 (0.70, 1.48)	0.79 (0.53, 1.18)	1.27 (0.84, 1.91)	0.037 (-0.076, 0.151)	0.518
Hyperactivity <sup>c</sup>	1.00	0.92 (0.63, 1.34)	0.76 (0.52, 1.13)	0.98 (0.65, 1.49)	-0.043 (-0.158, 0.072)	0.462
Conduct problems c	1.00	0.75(0.51, 1.09)	0.73 (0.49, 1.08)	0.89 (0.59, 1.35)	-0.01 (-0.110, 0.090)	0.843
Peer problems <sup>c</sup>	1.00	0.91 (0.59, 1.41)	1.05 (0.67, 1.65)	0.87 (0.54, 1.41)	0.002 (-0.090, 0.094)	0.964
Prosocial behavior c	1.00	0.87 (0.60, 1.26)	1.27 (0.86, 1.86)	1.18 (0.79, 1.77)	-6.0 (-11.8, -0.2)	0.041*
Developmental coordination disorder <sup>d</sup>	1.00	1.05 (0.68, 1.62)	1.12 (0.70, 1.76)	0.83 (0.51, 1.36)	22.6 (-153.2, 198.5)	0.800

PFOA concentrations (ng/mL): 1st quartile(<LLOQ-3.95), 2nd quartile (3.96-5.32), 3rd quartile (5.35-7.11), and 4th quartile (7.14-21.90) LLOQ, the lower limit of quantitation (1 ng/mL).

PFOA concentrations in linear regression were natural log-transformed

<sup>&</sup>lt;sup>a</sup> Ordinal Logistic regression models, in which the outcomes were recoded as the following: total difficulties score (old values were in brackets) [0 (0-1), 1 (2-3), 2 (4-5), 3 (6-7), 4 (8-10),5(≥11)], emotional symptoms [0 (0), 1 (1), 2 (2),3 (≥3)], hyperactivity [0 (0), 1 (1), 2 (2), 3 (≥3)], conduct problems [0 (0), 1 (1), 2 (2),3 (≥3)], peer problems [0 (0), 1 (1), 2 (≥2)], prosocial behavior [0 (10), 1 (9), 2 (8), 3 (≤7)], and developmental coordination disorder [0 (≤64), 1 (64-69), 2 (70-73), 3 (≥74)]

<sup>&</sup>lt;sup>b</sup> Multiple linear regression, the full transformation for the total difficulties score and four subscales of SDQ (emotional symptoms, hyperactivity, conduct problems, peer problems):  $\log_2$  (score+1). The full transformation for the scores of prosocial behavior and developmental coordination disorder: (score)<sup>4</sup> (a power transformation with p = 4); and the transformed prosocial behavior score was divided by 100 and the transformed developmental coordination disorder was divided by 10,000.

<sup>&</sup>lt;sup>c</sup> Adjusted for parity, maternal age, pre-pregnancy BMI, smoking and alcohol consumption during pregnancy, socio-occupational status, gender of child, breastfeeding, birth year, home density, gestational age at blood drawing, and parental behavioral problem scores during their childhood <sup>d</sup> Adjusted for parity, maternal age, pre-pregnancy BMI, smoking and alcohol consumption during pregnancy, socio-occupational status, gender of child, breastfeeding, birth year, home density, and gestational age at blood drawing <sup>\*</sup> Statistically significant p < 0.05

Supplemental Material, Table 4. Comparisons of characteristics between those included and not included in the study

Exposure and covariates         Not Included         Included           PFOS [median (IQR)] (ng/mL) * a,b         32.7 (25.4,41.7)         34.4 (26.6,44.5)           PFOA [median (IQR)] (ng/mL) * a,b         5.1 (3.8,6.8)         5.4 (4.0,7.1)           Maternal age at delivery (yr)         30.4±4.4         30.8±4.3           (Mean±SD)         3592.7±21.6         3652.0±18.8           Low birth weight (%)         2.1         1.4           Preterm birth (%) b         4.9         2.9           Parity (%)         4.9         2.9           Parity (%)         4.9         2.9           Preterm birth (%) b         4.9         2.9           Parity (%)         0         45.0         44.5           1         37.0         35.7           ≥2         17.9         19.8           Pre-pregnancy BMI (%) *         5.6         3.1           18.5 kg/m²         5.6         3.1           18.5 ykg/m²         6.1         69.6           25.0-29.9 kg/m²         24.6         19.2           ≥30.0 kg/m²         6.7         8.1           Maternal socio-occupational status (%)         47.1         53.6           Middle         43.5         38.2	and not included in the study		
PFOA [median (IQR)] (ng/mL)       3.1 (3.8, 6.8)       5.4 (4.0, 7.1)         Maternal age at delivery (yr)       30.4±4.4       30.8±4.3         (Mean±SD)       3592.7±21.6       3652.0±18.8         Low birth weight (%)       2.1       1.4         Preterm birth (%) b       4.9       2.9         Parity (%)       4.5       4.9       2.9         Parity (%)       0       45.0       44.5         1       37.0       35.7       2.2       17.9       19.8         Pre-pregnancy BMI (%)*       2       17.9       19.8         Pre-pregnancy BMI (%)*       3652.0±89.8       35.7       2.9         Pre-pregnancy BMI (%)*       3652.0±89.8       35.7       2.9         Pre-pregnancy BMI (%)*       3652.0±89.8       35.7       2.9       2.0       2.0       3.1       19.8       2.0		Not Included	Included
PFOA [median (IQR)] (ng/mL) a,b	Tros (median (tQK)) (ng/mL)	32.7 (25.4,41.7)	34.4 (26.6, 44.5)
Mean±SD    Sirth weight (g) (Mean±SD  *   3592.7±21.6   3652.0±18.8     Low birth weight (%)		5.1 (3.8, 6.8)	5.4 (4.0, 7.1)
Birth weight (g) (Mean±SD) *       3592.7±21.6       3652.0±18.8         Low birth weight (%) *       2.1       1.4         Preterm birth (%) *       4.9       2.9         Parity (%)       4.9       2.9         Parity (%)       3.0       4.5.0       4.4.5         1       37.0       35.7       2.2       17.9       19.8         Pre-pregnancy BMI (%) *       *       *       19.8       *         Pre-pregnancy BMI (%) *       *       5.6       3.1       69.6       25.0-29.9 kg/m²       24.6       19.2       25.0-60.6       26.6       28.1       26.6       28.1       29.3       8.1       28.1       29.3       8.15       29.3       8.15       29.3       8.15       29.3       29.0       29.2       24.5       24.5       24.5       24.5       24.5       24.5       24.5       24.5       24.5       24.5       24.5       24.5	Maternal age at delivery (yr)	$30.4 \pm 4.4$	$30.8 \pm 4.3$
Low birth weight (%)       2.1       1.4         Preterm birth (%)       4.9       2.9         Parity (%)       34.9       2.9         0       45.0       44.5         1       37.0       35.7         ≥2       17.9       19.8         Pre-pregnancy BMI (%)*       *         <18.5 kg/m²	(Mean±SD)		
Low birth weight (%)       2.1       1.4         Preterm birth (%)       4.9       2.9         Parity (%)       34.9       2.9         0       45.0       44.5         1       37.0       35.7         ≥2       17.9       19.8         Pre-pregnancy BMI (%)*       *         <18.5 kg/m²	Birth weight (g) (Mean±SD) *	3592.7±21.6	$3652.0\pm18.8$
Preterm birth (%) b       4.9       2.9         Parity (%)       45.0       44.5         1       37.0       35.7         ≥2       17.9       19.8         Pre-pregnancy BMI (%) *       17.9       19.8         Pre-pregnancy BMI (%) *       5.6       3.1         18.5-24.9 kg/m²       5.6       3.1       69.6         25.0-29.9 kg/m²       24.6       19.2         ≥30.0 kg/m²       6.7       8.1         Maternal socio-occupational status (%)       *         *       Higher       47.1       53.6         Middle       43.5       38.2         Lower       9.33       8.15         House Density (%) b       *       *         <1 room/person		2.1	1.4
0       45.0       44.5         1       37.0       35.7         ≥2       17.9       19.8         Pre-pregnancy BMI (%) *       17.9       19.8         Pre-pregnancy BMI (%) *       19.8       19.8         Pre-pregnancy BMI (%) *       5.6       3.1         18.5-24.9 kg/m²       63.1       69.6         25.0-29.9 kg/m²       24.6       19.2         ≥30.0 kg/m²       6.7       8.1         Maternal socio-occupational status (%)       *         *       Higher       47.1       53.6         Middle       43.5       38.2         Lower       9.33       8.15         House Density (%) b       *       *         <1 room/person		4.9	2.9
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Parity (%)		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	0	45.0	44.5
Pre-pregnancy BMI (%) *         <18.5 kg/m²	1	37.0	35.7
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	≥2	17.9	19.8
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Pre-pregnancy BMI (%) *		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$<18.5 \text{ kg/m}^2$	5.6	3.1
≥30.0 kg/m²       6.7       8.1         Maternal socio-occupational status (%)*       47.1       53.6         Middle       43.5       38.2         Lower       9.33       8.15         House Density (%) b       25.6       24.5         1 room/person       32.3       29.0         1-1.5 room /person       21.9       28.0         ≥1.5 room /person       20.2       18.6         Alcohol consumption before pregnancy       57.8       54.3         < 1 drink/week	$18.5-24.9 \text{ kg/m}^2$	63.1	69.6
# Higher	$25.0-29.9 \text{ kg/m}^2$	24.6	19.2
Higher 47.1 53.6 Middle 43.5 38.2 Lower 9.33 8.15  House Density (%) b 9.33 8.15  House Density (%) b 25.6 24.5 1 room/person 32.3 29.0 1-1.5 room /person 21.9 28.0 ≥1.5 room /person 20.2 18.6  Alcohol consumption before pregnancy (%) 57.8 54.3 < 1 drink/week 15.2 16.1 1-<2 drinks/week 15.4 17.1 ≥ 2 drinks/week 15.4 17.1 ≥ 2 drinks/week 11.7 12.5 Smoking during pregnancy (%) 52.5 49.3 Duration of breastfeeding (%) 53.5 49.3 Duration of breastfeeding (%) 53.5 49.3 3-5 month 16.8 13.3 3-5 months	$\geq 30.0 \text{ kg/m}^2$	6.7	8.1
Middle Lower       43.5       38.2         Lower       9.33       8.15         House Density (%) b <ul> <li>&lt;1 room/person</li> <li>25.6</li> <li>24.5</li> <li>1 room/person</li> <li>32.3</li> <li>29.0</li> </ul> 1-1.5 room /person             21.9             28.0               ≥1.5 room /person             20.2             18.6               Alcohol consumption before pregnancy              57.8             54.3               <1 drink/week	Maternal socio-occupational status (%)		
Middle Lower       43.5       38.2         Lower       9.33       8.15         House Density (%) b <ul> <li>&lt;1 room/person</li> <li>25.6</li> <li>24.5</li> <li>1 room/person</li> <li>32.3</li> <li>29.0</li> </ul> 1-1.5 room /person             21.9             28.0               ≥1.5 room /person             20.2             18.6               Alcohol consumption before pregnancy              57.8             54.3               <1 drink/week	*		
Lower       9.33       8.15         House Density (%) b       25.6       24.5         <1 room/person		47.1	53.6
House Density (%) b  <1 room/person 1 room/person 32.3 29.0 1-1.5 room /person ≥1.5 room /person Alcohol consumption before pregnancy (%) Nondrinker <1 drink/week <1 drink/week 1-<2 drinks/week 15.4 17.1 ≥2 drinks/week 15.4 17.1 ≥2 drinks/week 11.7 Smoking during pregnancy (%) * Sex of child (boy, %) Suration of breastfeeding (%) * <3 month <3 months 16.8 13.3 3-5 months 20.9 18.2	Middle	43.5	38.2
<1 room/person		9.33	8.15
1 room/person       32.3       29.0         1-1.5 room /person       21.9       28.0         ≥1.5 room /person       20.2       18.6         Alcohol consumption before pregnancy       (%)         Nondrinker       57.8       54.3         < 1 drink/week	House Density (%) <sup>b</sup>		
1-1.5 room /person 21.9 28.0 ≥1.5 room /person 20.2 18.6  Alcohol consumption before pregnancy (%)  Nondrinker 57.8 54.3 <1 drink/week 15.2 16.1 1-<2 drinks/week 15.4 17.1 ≥2 drinks/week 11.7 12.5  Smoking during pregnancy (%) * 29.7 21.1  Sex of child (boy, %) 52.5 49.3  Duration of breastfeeding (%) *  <3 month 16.8 13.3 3-5 months 20.9 18.2	<1 room/person	25.6	24.5
≥1.5 room /person 20.2 18.6  Alcohol consumption before pregnancy (%)  Nondrinker 57.8 54.3  < 1 drink/week 15.2 16.1  1-<2 drinks/week 15.4 17.1  ≥ 2 drinks/week 11.7 12.5  Smoking during pregnancy (%) * 29.7 21.1  Sex of child (boy, %) 52.5 49.3  Duration of breastfeeding (%) *  <3 month 16.8 13.3  3-5 months 20.9 18.2	1 room/person	32.3	29.0
Alcohol consumption before pregnancy (%)  Nondrinker $< 1 \text{ drink/week}$ $15.2$ $16.1$ $1-<2 \text{ drinks/week}$ $15.4$ $17.1$ $\ge 2 \text{ drinks/week}$ Smoking during pregnancy (%) * $< 3 \text{ month}$ $< 3 \text{ months}$	1-1.5 room /person	21.9	28.0
(%)       Nondrinker       57.8       54.3         < 1 drink/week	-	20.2	18.6
Nondrinker       57.8       54.3         <1 drink/week	Alcohol consumption before pregnancy		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			
$1-<2 \text{ drinks/week}$ $15.4$ $17.1$ $\geq 2 \text{ drinks/week}$ $11.7$ $12.5$ Smoking during pregnancy (%) * $29.7$ $21.1$ Sex of child (boy, %) $52.5$ $49.3$ Duration of breastfeeding (%) * $<<<>>       <<<>><<<>><<<>><<<>><$			
			16.1
Smoking during pregnancy (%) *       29.7       21.1         Sex of child (boy, %)       52.5       49.3         Duration of breastfeeding (%) *       3 month       16.8       13.3         3-5 months       20.9       18.2	1-<2 drinks/week	15.4	17.1
Sex of child (boy, %)       52.5       49.3         Duration of breastfeeding (%) *       16.8       13.3         3-5 months       20.9       18.2	$\geq 2 \text{ drinks/week}$	11.7	12.5
Duration of breastfeeding (%) * <3 month	Smoking during pregnancy (%) *	29.7	21.1
<3 month 3 months 16.8 20.9 18.2		52.5	49.3
3-5 months 20.9 18.2			
	<3 month	16.8	13.3
$\geq$ 6 months 62.3 68.5	3-5 months	20.9	18.2
	≥6 months	62.3	68.5

<sup>\*</sup> p-values <0.05

a When taking birth year into consideration, PFOS and PFOA concentrations among those included in this study was not statistically significantly different from those not included.

<sup>&</sup>lt;sup>b</sup> IQR: interquartile